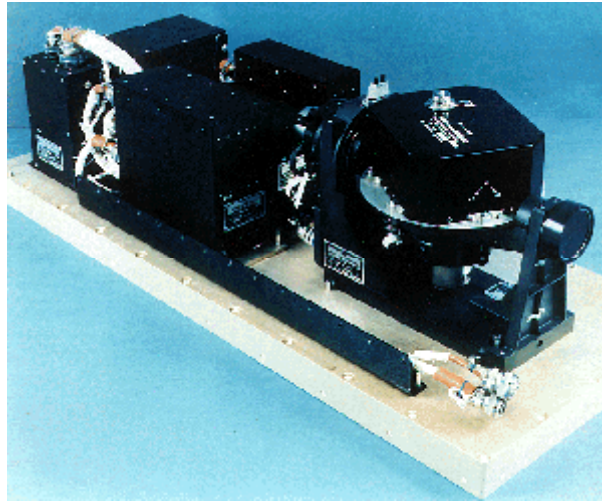


Real-Time Data From the Orbital Acceleration Research Experiment (OARE)



Orbital Acceleration Research Experiment.

The objective of the Orbital Acceleration Research Experiment (OARE) is to measure, with high accuracy, the low-frequency, low-magnitude acceleration levels onboard the space shuttle. The shuttle experiences acceleration from atmospheric drag, gravity gradient forces, shuttle rotations, crew activities, water/waste dumps, and shuttle attitude thrusters. The OARE instrument has successfully flown on five past shuttle missions and is scheduled for five upcoming microgravity science missions. The data collected by OARE will be utilized by microgravity scientists to better predict and analyze the influence and effects of the shuttle's on-orbit microgravity environment on experiments in materials, combustion, and fluids research.

During previous shuttle missions, OARE data were recorded on the space shuttle payload recorder for later transmission to the ground. The second United States Microgravity Laboratory (USML-2), which is scheduled to fly in the fall of 1995, has a requirement for OARE to provide acceleration data to payload scientists in real-time. Payload scientists will use OARE data to verify the predicted microgravity acceleration environment and possibly adjust the orbiter attitude to minimize acceleration disturbances. The OARE instrument has been modified to provide real-time acceleration telemetry data through the shuttle Spacelab High-Rate Multiplexer for transmission to the Payload Operations Control Center at the NASA Marshall Space Flight Center.

OARE acceleration telemetry will be processed and analyzed by members of the Principal Investigator Microgravity Services (PIMS) team from the NASA Lewis Research Center. This team will acquire OARE data at the Payload Operations Control Center, compute sensor bias, perform low-frequency filtering, and display the data with graphics-based

workstations. They will also provide expert analysis of the acceleration data provided by OARE.

The OARE and PIMS efforts are part of the Microgravity Measurements and Analysis Project at Lewis. OARE comprises a team of NASA civil servants and contractors from Canopus Systems Incorporated (CSI).